



WILD Kids



4-6

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Arizona's Instant Aquatic Arthropods

During the brief summer monsoon small aquatic arthropods appear as if by magic. They are desert shrimp. They live in mud puddles and ponds all across Arizona. Three types of desert shrimp are found in ephemeral pools. Ephemeral means temporary or seasonal. They are the clam shrimp, fairy shrimp and tadpole shrimp.

All three desert shrimp live for only a short time. Their entire life cycle may only last a few weeks. During the time it takes for a mud puddle to fill and dry, these arthropods will go from an egg to a reproducing adult.

Desert shrimp grow quickly in warm water. They can almost double their size in one day! Because they grow so fast, desert shrimp need lots of food. All three desert shrimp are detritus filter-feeders. This means that they feed on dead and rotting vegetation and animal material stirred up from the bottom of the mud puddles. Desert shrimp do little else but eat, day and night.

Almost any puddle formed during the summer monsoon can be home to desert shrimp. Their eggs can dry up and still hatch up to 50 years later. These eggs are so tiny they can be carried by the wind for long distances. Wind blown eggs

naturally settle in low spots on the ground. These low spots are likely areas to form puddles during the monsoon. Eggs can also be carried on feathers of birds that take dust baths in dried up puddles.

The oxygen level increases when water is added to a dry mud puddle. Desert shrimp eggs can sense the oxygen level in water and will not hatch until enough oxygen is present and the water is warm.

Dormant eggs do not always hatch upon contact with water. Along with oxygen levels, water temperature plays an important role. Mud puddles that form in the summer are warm and lots of food grows in them for the young shrimp to eat. Young shrimp can even tolerate water temperatures over 100° F. When winter rains form mud puddles the water temperature is cold. There is less food produced in cold water than in warm water.

Adult desert shrimp die soon after reproducing. The bodies of dead adults help to produce a fertile environment for the next generation of desert shrimp.

Clam Shrimp



The clam shrimp looks like a clam. It can swim through the water by using its swimming arms. The clam shrimp has a single eye. This eye is easily seen near the swimming arms. The clam shrimp does not molt. (Most arthropods shed their hard outer covering, called an exoskeleton, as they grow larger. Molting is a process that arthropods use to shed their old exoskeleton.) As the clam shrimp gets bigger, growth rings are added to its shell.

Eggs are carried inside the shell or carapace of the clam shrimp and are easily seen. They look like small,

opaque, pinhead-sized balls. Once the eggs are mature they are randomly deposited on the bottom of a puddle.

Fairy Shrimp

Fairy shrimp are pale orange-colored animals with dark eyes. They swim on their backs using their feet in a wave-like motion. They are very closely related to brine shrimp that are used to feed fish.

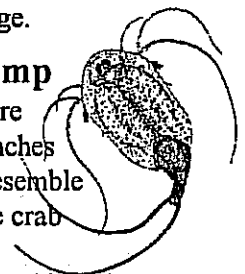
Males and females are easily distinguished. Male fairy shrimp have two enlarged, clasping antenna located behind the first antenna. Eggs are carried by the female in a brood chamber. The brood chamber is located just behind the last



leaf-like appendage.

Tadpole Shrimp

Tadpole shrimp are large, up to 2½ inches in length. They resemble a small horseshoe crab because most of their body is covered by a large shield-like carapace. Tadpole shrimp feed by shifting through the debris on the bottom of puddles for edible material. They also feed at the water's surface by turning on their backs. Tadpole shrimp can, at times, be predators and even eat other tadpole shrimp. They will also scavenge carcasses of tadpoles and other small animals.



(turn over)

Activity I: Grow Your Own Desert Shrimp

1. The first step in growing desert shrimp is to get some soil that contains desert shrimp eggs. Collect a few clods of dirt from a puddle that had desert shrimp in the past. If you do not have access to such a puddle, ask your teacher (there is an address to get soil in their *Focus Wild* newsletter.)
2. Next fill a one gallon jar or small aquarium with distilled water about full. You can also use tap water, but let it sit in an open container overnight (allowing the chlorine to escape from the water.).
3. Add a couple of clods of dirt. Place the container near a window with good sunlight. The sunlight will heat up the water. Warm water is essential for the eggs to hatch. If you do not have a window in your classroom, place a reptile heating pad under the container. The heating pad should warm the water up enough for the eggs to hatch.
4. After a day or two you may be fortunate enough to see the hatchling shrimp. Place a flashlight a one side of the container. Turn it on. The hatchling shrimp will at first appear as swirling white specks in the water. These young shrimp can take care of themselves for the first couple of weeks. Stir the water in the jar lightly every day so the filter feeding shrimp will be able to feed.
5. When the shrimp reach approximately $\frac{1}{2}$ inch, you may want to get them a bigger container (a ten gallon aquarium works great.). You do not need to place any kind of filter in the tank.
6. At this time you may need to start feeding your shrimp commercial fish foods. A small pinch every day is plenty. Do not put too much food in at one time. You may foul your tank. It is best to grind up the food so it is in very small pieces. Then, to keep the food from floating, soak it briefly in a little water. Then add the mix to the tank and gently stir.
7. If the tadpole shrimp begin consuming the other desert shrimp in your tank, you may want to move them to their own tank. Even in their own tank tadpole shrimp may occasionally eat one another. Do not put desert shrimp and fish together. Fish will eat every last one of the desert shrimp!
8. The longest desert shrimp live is about 6 weeks. If you see egg sacks on the shrimp you may want to keep the mud for another time. You can remove the mud and dry it out for next time or just let your tank dry out completely and then add new water (The glass on your tank will become very cloudy. Just remove the mud, scrape the sides and wipe out. Replace the mud and you are ready again.).

How many generations can you get in one school year?

Activity II: Seek and Find

Find and circle the following words in the puzzle. Words may be found spelled forward, backward or on a diagonal. What sentence do the uncircled letters spell out?

C	C	D	P	M	I	R	H	S	Y	R	I	A	F
L	E	X	O	S	K	E	L	E	T	O	N	R	S
A	U	S	T	O	A	C	C	E	A	N	S	M	E
M	D	E	S	E	R	T	S	A	P	I	O	D	L
S	E	R	S	I	N	B	S	E	P	L	C	T	D
H	M	O	N	S	O	O	N	S	T	A	A	R	D
R	E	C	I	T	A	U	Q	A	A	R	R	T	U
I	D	E	T	R	I	T	U	S	H	R	O	A	P
M	P	O	O	L	A	R	E	M	E	H	P	E	C
P	M	I	R	H	S	E	L	O	P	D	A	T	D

Aquatic
Brood
Bottom
Carapace
Clamshrimp
Desert
Detritus

Ephemeral
Exoskeleton
Fairyrshrimp
Molt
Monsoon
Puddles
Tadpoleshrimp